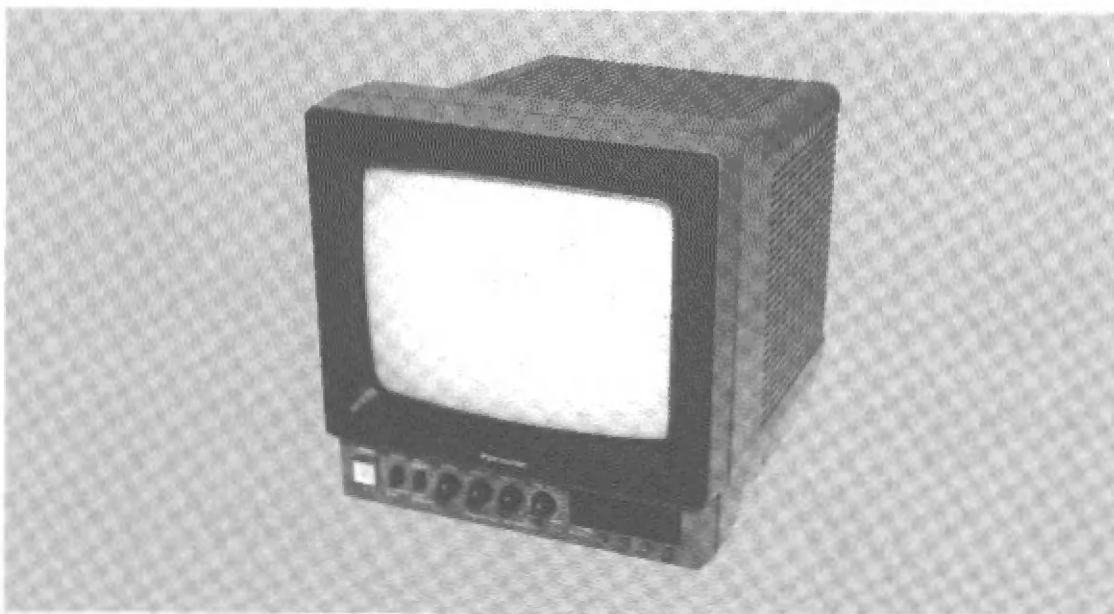


# Operating Instructions

Mini CCTV Monitor  
**WV-BM90A**

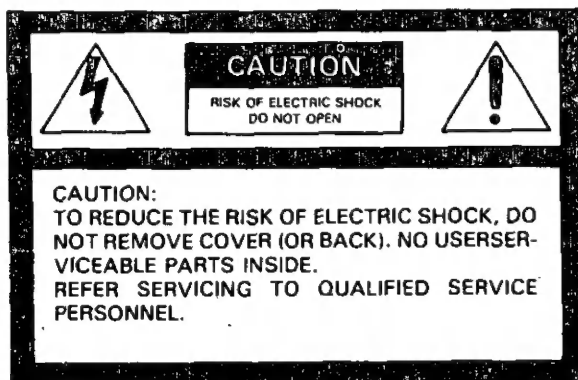


**Panasonic.**

Before attempting to connect or operate this product, please read these instructions completely.

# CONTENTS

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WV-BM90A SYSTEM PARTS AND ACCESSORIES .....	4
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SA 1965

The lightning flash with arrowhead symbol, within an equilateral triangle, is intended to alert the user to the presence of uninsulated "dangerous voltage" within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.



SA 1966

The exclamation point within an equilateral triangle is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the appliance.

For U.S.A.

## Warning:

This equipment generates and uses radio frequency energy and if not installed and used properly, i.e., in strict accordance with the instruction manual, may cause harmful interference to radio communications.

It has been tested and found to comply with the limits for a Class A computing device pursuant to Subpart J of Part 15 of FCC Rules, which are designed to provide reasonable protection against such interference when operated in a commercial environment.

For CANADA

This digital apparatus does not exceed the Class A limits for radio noise emissions from digital apparatus set out in the Radio Interference Regulations of the Canadian Department of Communications.

The serial number of this product may be found on the bottom and rear covers of the unit.

You should note the serial number of this unit in the space provided and retain this book as a permanent record of your purchase to aid identification in the event of theft.

Model No. \_\_\_\_\_

Serial No. \_\_\_\_\_

## WARNING:

TO PREVENT FIRE OR SHOCK HAZARD, DO NOT EXPOSE THIS APPLIANCE TO RAIN OR MOISTURE.

## PREFACE

Panasonic Mini CCTV System consists of a Solid State Camera WV-BL90A or Vidicon Type Camera WV-80 and a Video Monitor WV-BM90A with built-in sequential switcher. WV-BL90A and WV-80 cameras are simple to install and operate.

The Mini CCTV monitor WV-BM90A can function the audio circuit by using the camera WV-BL90A (with the optional microphone unit WV-MC1).

Just attach the mounting bracket to wall or ceiling, aim the camera and focus. A single coaxial cable is used for connection between the camera and monitor, and supplies the low voltage DC power and synchronizing vertical (V) drive pulse to the cameras. This economical Mini CCTV System has been specially designed for the surveillance needs at offices, factories, stores, schools hospitals, public and residential building, etc.

## FEATURES

### Mini CCTV Monitor WV-BM90A

- As many as four WV-BL90A or WV-80 cameras can be connected to one video monitor/sequential switcher with alarm feature and an additional three more WV-BL90A or WV-80 cameras can be utilized by using the camera extension unit WV-83.
- One video output displays each camera in sequence if selected or any camera switched to the spot monitor position. For use with additional monitor or video tape recorder.
- Monitor has 9" diagonal screen (8-1/2" diagonal actual visual size).
- Sequential switching interval is manually adjustable from 1 to 30 seconds.
- Inputs for 4 spot monitor controls : intercom, alarm sensors and switch such as light beam switch, door switch, window switch, mat switch etc.
- Built-in protection circuit for the camera and monitor in case of misconnection.
- STANDBY mode for no picture on the monitor during sequential switching.
- Alarm control output for a buzzer or chime.
- Alarm period manually adjustable from 2 to 30 seconds (1 second step)
- VTR playback picture can be observed.
- Reset input for sequential switching from Time Lapse VTR.
- Automatic bypass circuit for skipping the channel(s) of no camera connection.
- Selectable automatic bypass or manual bypass.
- Built-in Automatic Reset Selection Switch for Spot Monitor Control Input. The automatic reset time is preset at 60 seconds.
- An audio circuit is built-in.

### Optional Mini CCTV Camera

#### ■ WV-BL90A

- 1/2-inch interline CCD image sensor with 574 (H) x 489 (V) pixels.
- 420 lines of horizontal resolution.
- 0.5 lux of minimum scene illumination at F1.4.
- Optional microphone unit WV-MC1 can be used.
- Optional CS mount (Special C mount) lens can be used.
- Optional C mount lens can be used together with optional lens Converter (C mount adaptor) WV-AD20.
- Selectable automatic gain control (AGC) ON or OFF.
- Selectable Auto iris Control Signal for the lens either video or DC control signal.
- A single coaxial cable for connection between the camera and the monitor.
- Coaxial cable distance between the camera and monitor can be extended up to approx. 890ft.(270m) with RG-59/U (3C-2V), and approx. 2210ft.(670m) with RG-6/U (5C-2V).
- Built-in protection circuit for misconnection.

#### ■ WV-80

- A single coaxial cable for connection between the camera and the monitor.
- Coaxial cable distance between the camera and monitor can be extended up to approx. 100 m with RG-59/U (3C-2V), approx. 250 m with RG-6/U (5C-2V). See page 12 for cables.
- Three signals are carried by a single coaxial cable : Video, DC Power and Vertical Drive Pulses.
- Automatic light compensation allows to use under a wide range of light conditions.
- Built-in protection circuit for misconnection.
- 2/3" high sensitive electrostatic focusing magnetic deflection, separate mesh pick-up tube.

# PRECAUTIONS

## Mini CCTV Monitor WV-BM90A

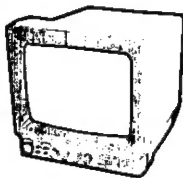
- Do not block the ventilation slots. Do place the video monitor at least 2" ( 5 cm) apart from the wall.
- Do not expose the monitor to water or moisture. Do not operate the monitor if it becomes wet. Do take immediate action if ever the monitor does become wet. Turn power off and refer servicing to qualified service personnel. Moisture can damage the monitor and also create the danger of electric shock. Do not attempt to disassemble the monitor. To prevent electric shock, do not remove screws or cover. There are no user-serviceable parts inside. Refer servicing to qualified service personnel.
- Use the monitor under conditions where temperature are 14°F - 122°F (-10°C - +50°C) and humidity is below 90%.
- Do not drop the metallic parts through slots. This action could permanently damage the monitor. Do turn the power off immediately and refer servicing to qualified service personnel.
- If the monitors are placed side by side, the pictures on the monitors may interfere with each other. It is recommended that the monitors should be placed or installed more than 6"(15 cm) away each other.
- Do not stack the monitors.
- This apparatus must be grounded to avoid interference to the picture.

## Cameras WV-BL90A and WV-80

- Do not aim the camera toward the sun or other extremely bright objects, whether it is turned on or not. For vidicon type camera WV-80, this action could permanently damage the pick-up tube. Do not aim the camera to record or monitor bright stationary scenes for prolonged periods of time.
- Do not let the lens remain uncapped when the camera is not in use. If the lens is not installed, do not leave the lens mount hole uncovered.
- Do not expose the camera to rain or moisture or not try to operate it in wet areas. Do not operate the camera if it becomes wet.
- Do not attempt to disassemble the camera. In order to prevent electric shock, do not remove screws or covers. There are no user-serviceable parts inside.
- Use the camera under conditions where temperature are within -22°F - 122°F (-30°C - +50°C) for WV-BL90A and 14°F - 122°F (-10°C - +50°C) for WV-80 and humidity is below 90%.
- Do not use strong or abrasive detergents when cleaning the camera body. Do use a dry cloth to clean the camera when dirty. In case the dirt is hard to remove, use mild detergent and wipe gently.

# WV-BM90A SYSTEM PARTS AND ACCESSORIES

## ■ Video Monitor WV-BM90A



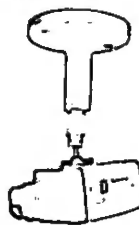
WV-BM90A

## ■ Optional Accessory for WV-BM90A

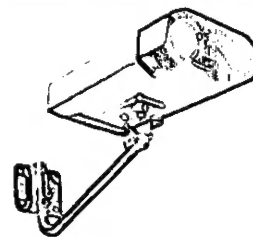


Camera Extension Unit  
WV-83

## ■ Optional Cameras

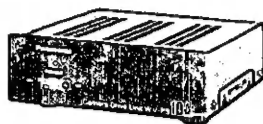


WV-BL90A

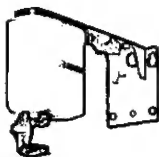


WV-80

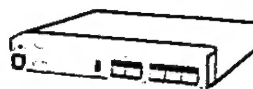
## ■ Optional Accessories for WV-BL90A



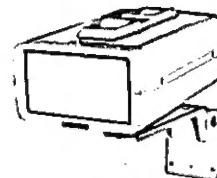
Camera Drive Unit  
WV-PS10A



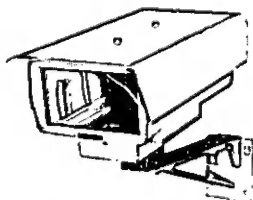
Auto Panning Head  
WV-35A



Remote Control Unit  
WV-32

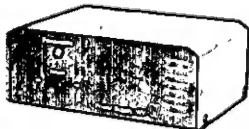


Camera Housing  
WV-40



Drip Proof Fan/Heater  
Housing

WV-46/KT



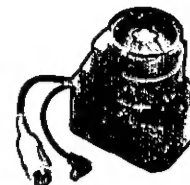
Power Supply



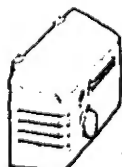
Automatic Iris  
Control Lens  
WV-LA2.8  
WV-LA4.5  
WV-LA6B2  
WV-LA12B2  
WV-LA18  
WV-LA36



Manual Iris  
Control Lens  
WV-LM4.5  
WV-LM6B2  
WV-LM12B2



Automatic Iris  
Zoom Lens  
WV-LZ81/6A  
WV-LZ81/10



Microphone Unit  
WV-MC1

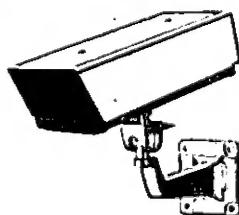


Aspherical Hi-speed Lens  
WV-LA4510  
WV-LA608  
WV-LA1208

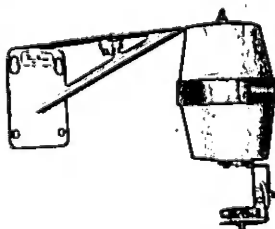


C-Mount Adaptor  
WV-AD20

## ■ Optional Accessories for WV-80



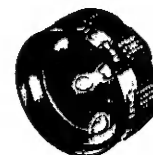
Heavy-duty Camera  
Housing WV-95



Panning Head  
WV-435



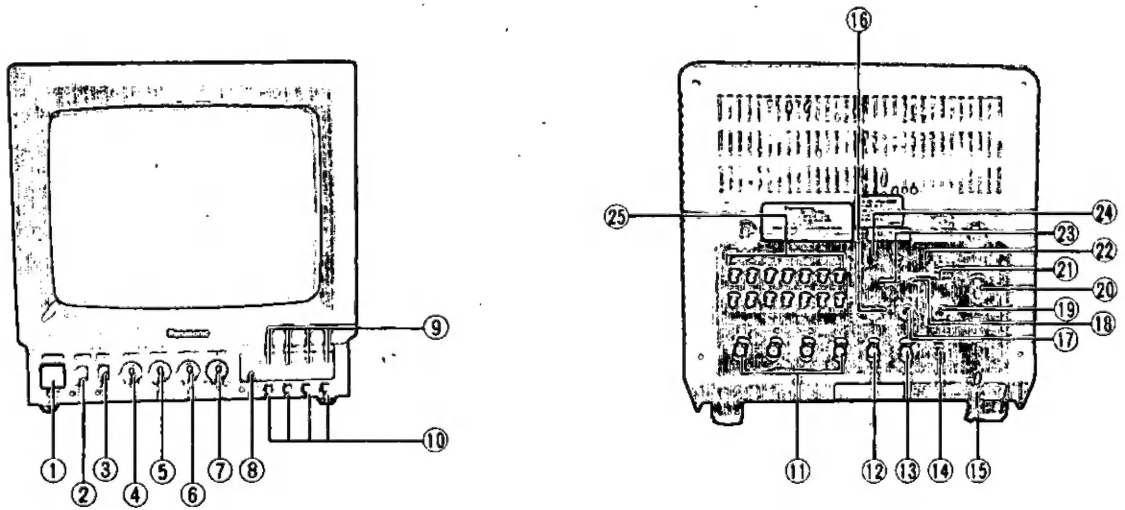
Remote Control Unit  
WV-438



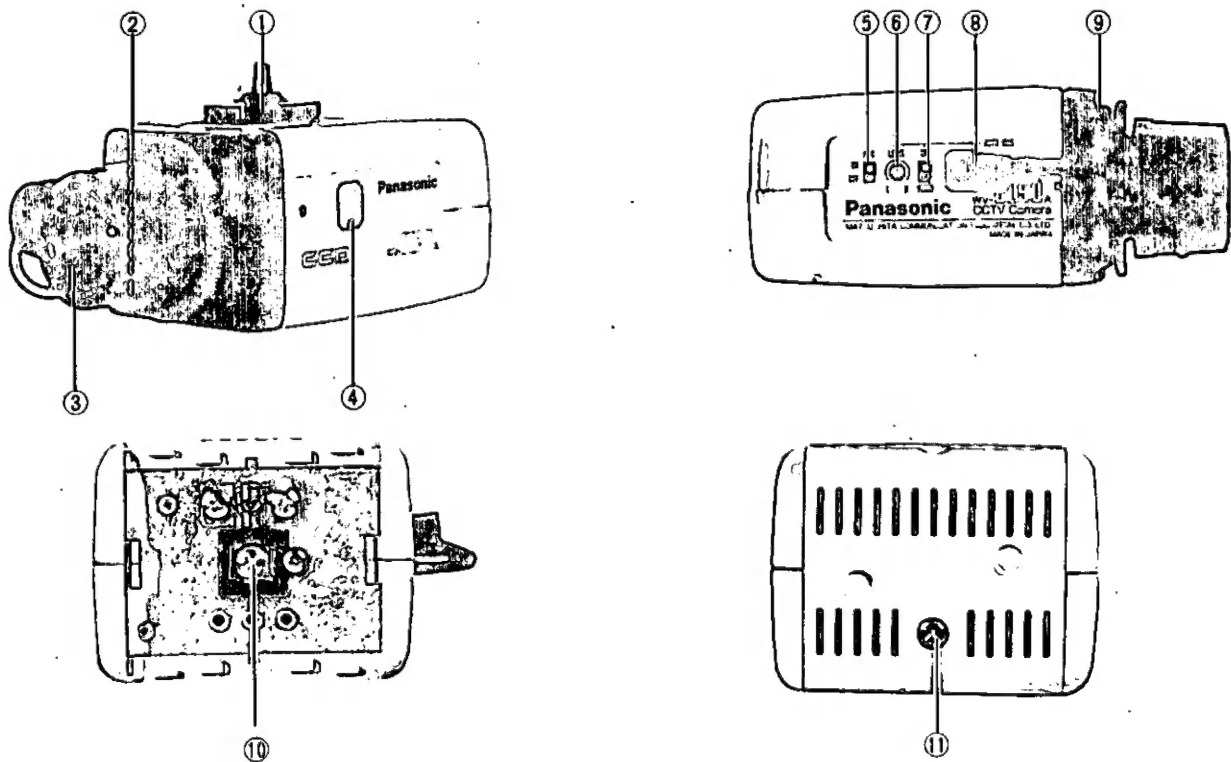
Wide Angle Lens  
VZ-ML10

# MAJOR OPERATING CONTROLS AND THEIR FUNCTIONS

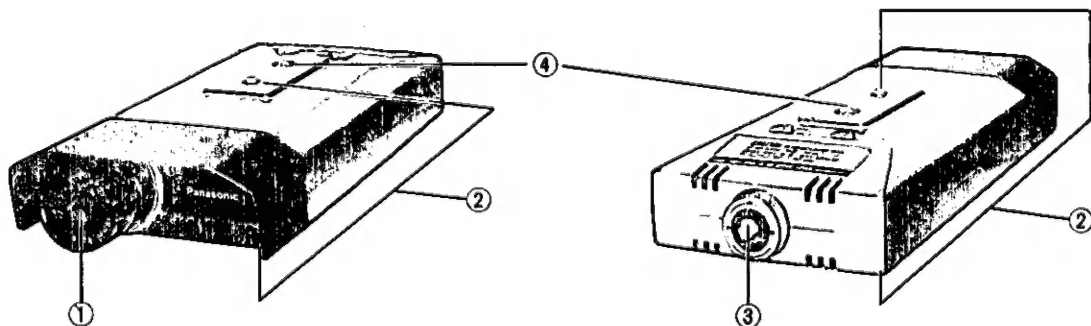
## Video Monitor WV-BM90A



## CCTV Camera WV-BL90A




## Mini CCTV Camera CCTV WV-80




## □ Video Monitor WV-BM90A

### 1. Power ON/OFF Switch (POWER)

This is a push type switch which turns on or off the power of monitor.

Push once and the switch remains down (  ) for turning on the power of monitor and cameras.

Sequence and camera number indicator lamps light on. Push again, the switch comes up (  ) for turning off the power of monitor and cameras, and the lamps go off.

### 2. Mode Selection Switch (MODE STANDBY/ON)

This selects the condition of the monitor as follows;

#### ON:

The cameras video signal will appear on the monitor.

#### STANDBY:

The cameras video signal will not appear on the monitor. However the video signal is still provided at Video Output Connector (11).

### 3. Input Selection Switch (INPUT SELECT EXT/CAMERA)

This selects the condition of the monitor as follows;

#### EXT:

An external video source, such as a VTR, connected to the Video Input Connector (13) can be observed.

#### CAMERA:

Camera's connected to the Camera Input Connectors (11) can be observed.

### 4. Audio Control (AUDIO)

Turn this control clockwise to increase the audio level from either the WV-BL90A camera (equipped with the optional microphone, WV-MC1) or from the external audio input signal.

### 5. Bright Control (BRIGHT)

Turn this control clockwise to increase the picture brightness.

### 6. Contrast Control (CONTRAST)

Turn this control clockwise to increase the picture contrast.

### 7. Time Adjustment (TIME ADJ MIN/MAX)

The sequential switching interval can be manually adjusted from 1 to 30 seconds by adjusting this knob.

### 8. Sequence Switch (SEQUENCE)

This is a push-push type switch which selects the cameras in a sequential switching mode when this switch is pushed and its lamp will light. The switching interval can be adjusted by the Time Adjustment (7) from 1 to 30 seconds.

### 9. Camera Selection Switches

These are push-push type switches which are used to select a desired camera for observation on the monitor. When one of these switches is pushed on, the sequence switch goes off (if the sequence switch had been turned on) and the lamp for the selected camera turns on.

### 10. Bypass Selection Switches (BYPASS/AUTO)

These switches select the condition of monitor as follows;

#### BYPASS:

The picture of the selected camera will be skipped.

#### AUTO:

The channel(s) with no camera condition will be automatically skipped.

### 11. Camera Input Connectors (CAMERA INPUT)

These BNC type connectors are used to accept the single coaxial cable from the specified cameras.

These connectors supply DC power and vertical drive pulse to the cameras, and receive the video signal from the cameras.

#### Note:

- o Be sure to connect the specified cameras.
- o Connect the camera after making sure that the monitor is off.

If the camera is connected while the monitor is on, the camera will not function due to activation of the protection circuit for misconnection.

### 12. Video Output Connector (VIDEO OUT)

This BNC type connector is used to provide the video output signal of the cameras to an additional monitor or video tape recorder.

#### Note:

The video output signal of the camera is provided at this connector even if the Mode Selection Switch (2) is set to the STANDBY position.

### 13. Video Input Connector (VIDEO IN)

This video input connector can be used for observing the playback picture from a VTR.

When the VTR playback picture is to be shown on the video monitor, set the Input Selection Switch (3) to the EXT position and Mode Selection Switch (2) to the ON position.

### 14. Timing Output Connector (TIMING OUT)

This output connector provides the timing pulse signals for switching in the sequence operation for other systems, such as another Mini CCTV System or sequential switcher.

## 15. Power Cord

## 16. Audio Output Connector (AUDIO OUT)

The audio signal is available at this connector for use by external equipment such as a VTR. Connect an audio cable between this connector and the audio input connector of the external equipment.

## 17. Audio Input Connector (AUDIO IN)

The audio signal from an external source, such as a VTR, can be supplied to this connector for monitoring on the internal speaker. Connect an audio cable between this connector and the audio output connector of the external equipment.

### Note:

Set the input selection switch (3) to EXT position.

## 18. Timing Selection Switch (TIMING SELECT INT/EXT)

The audio signal from an external source, such as a VTR, can be supplied to this connector for mounting on the internal speaker. Connect an audio cable between this connector and the audio output connector of the external equipment.

### Note:

Set the input selection switch (3) to the EXT position.

### INT:

The timing pulses for the sequential switching interval are generated in the video monitor WV-BM90A.

### EXT:

The timing pulse for the sequential switching interval are synchronized with the external timing pulses fed to the External Timing Input Connector (19) from a time lapse VTR or another Mini CCTV System.

## 19. External Timing Input Connector (EXT IN)

This input connector is for the external timing pulses from a time lapse VTR or another Mini CCTV System.

## 20. Camera Extension Input Connector (CAMERA EXTENSION IN)

This is a 10-pin connector for the Camera Extension Unit WV-83 for expanding the system up to 7 cameras, the pin OVTS are as follows;

- Pin 1: Video Input Signal
- Pin 2: VD Output Signal
- Pin 3: Ground
- Pin 4: Logic Signal for Sequence
- Pin 5: Logic Signal for Sequence
- Pin 6: Logic Signal for Sequence
- Pin 7: Logic Signal for Sequence
- Pin 8: Logic Signal for Sequence
- Pin 9: Logic Signal for Sequence
- Pin 10: Logic Signal for Sequence

## 21. Camera Extension Switch (CAMERA EXTENSION, ON/OFF)

This selects the condition of camera extension function as follows:

### ON:

Camera signals connected to the Camera Extension Unit WV-83 can be observed on the monitor.

### OFF:

Select this position whenever the Camera Extension Unit WV-83 is not connected.

## 22. Vertical Hold Control (V.HOLD)

Locks in the picture on monitor vertically.

## 23. Auto Reset Switch (Auto Reset, ON/OFF)

This selects the condition of auto reset function as follows;

### ON:

The automatic reset function operates and the automatic reset time is set to approx. 60 seconds.

### OFF:

The automatic reset function is disabled.

## 24. Alarm Time Adjustment (ALARM TIME ADJ)

The alarm time can be manually adjustable by turning this control.

The alarm time can be set from 2 to 30 seconds (1 second steps).

## 25. External Control Connection Terminal (SPOT MONITOR CONTROL IN/RECOVER IN/ALARM CONTROL OUT/REMOTE OUT)

### • SPOT MONITOR CONTROL IN

The terminals of the Spot Monitor Control In are used to connect an intercom or alarm sensor for spot monitoring by short circuiting terminals 1, 2, 3 or 4.

When the Camera Extension Unit is used, the spot monitoring for cameras 5, 6 and 7 is performed at the extension unit spot terminals 5, 6 and 7.

If terminal 1 is shorted by intercom or alarm sensors, then camera No.1 is selected and its picture is observed on the monitor.

The pictures for cameras No.2, 3 or 4 (5, 6 or 7 when the Camera Extension Unit is used) can be observed in the same manner.

### Note:

The voltage of the short circuit for these terminals should be 0-0.2 volt when the intercom or alarm sensor is activated.



- **RECOVER IN**

To reset the spot monitor picture of the spotted camera and go back to the sequence operation, supply the reset signal from the time lapse VTR to this terminal.

- **ALARM CONTROL OUT**

The terminals for the Alarm Control Out are of the open collector type and are used to connect a buzzer or chime for sounding when the terminals of the Spot Monitor Control In is (are) shorted by intercom or alarm sensors.

- **ALL MODE-GND Connection**

The connected buzzer or chime will sound at both positions of the Mode Selection Switch (2) when the intercom or alarm is activated.

- **STANDBY-GND Connection**

The connected buzzer or chime will sound when the Mode Selection Switch (2) is positioned at STANDBY and the intercom or alarm is activated.

The power rate of the alarm should be up to DC 24V, max. 100mA.

If the power capacity of the remote is less than 100mA at DC 24V, the remote load can be connected at the terminal of Remote directly.

If the power capacity of the alarm is more than 100mA at DC 24V, the relay circuit should be used for the remote load.

- **REMOTE OUT Connection**

The terminals for the remote out are of the open collector type and can be connected to the spot monitor control in terminals of a second monitor.

This enables the first monitor to control the camera selection on the second monitor.

The terminals for the remote out can also be connected to the remote out can also be connected to the Remote In Terminals of the WV-32 remote control unit. This enables the monitor to control the operation of the auto panning head.

The RESET out terminal is used to connect to the RECOVER input terminal on another monitor.

## ■ CCTV Camera WV-BL90A

1. **Camera Mounting Screw Holes**

These holes are located on the top and bottom covers and are used to mount the camera onto a mounting bracket or tripod, and is threaded (1/4"-20).

2. **Power Indicator**

This lamp indicates that the camera is operating.

3. **Lens (Option)**

**CAUTION:**

Use an optional Lens Mount Converter (C mount adaptor) WV-AD20 to prevent damage of the inner glass and have proper flange-back length when an optional C mount lens is used.

4. **Microphone Unit Connector**

Connect the optional microphone unit, WV-MC1, to this connector for audio capability.

5. **AGC ON/OFF Switch (AGC, ON/OFF)**

This switch is used to select the gain of the video amplifier as follows;

**ON:**

When the lens iris is fully opened at low light shooting, a clear picture is obtained by an automatic increase of the gain.

**OFF:**

A natural and low-noise picture is obtained at low light shooting.

6. **Auto Iris Level Control**

**(AUTO IRIS LEVEL, L (Low)/H (High))**

This adjusts the control level of the auto iris control when the Lens Selection Switch (7) is set to the DC position and an auto iris which uses DC control voltage, such as a WV-LA12B2, is mounted on the camera.

**Note:**

When the Lens Selection Switch (7) is set to the VIDEO position and the auto iris level should be adjusted by the lens.

Adjust this control after setting the AGC ON/OFF Switch (5) to "OFF" position.

7. **Lens Selection Switch (AUTO IRIS, DC/VIDEO)**

This switch is used to select the type of auto iris control signal supplied to the lens from the Auto Iris Lens Connector (8).

**DC:**

Choose this position when an auto iris lens requiring DC control signal, such as WV-LA4.5, WV-LA18, WV-LA36, WV-LA6B2, WV-LA12B2, WV-LA4510, WV-LA1208 etc, is mounted on the camera.

#### **VIDEO:**

Choose this position when an auto iris lens requiring video signal, such as WV-LA8B, WV-LA16B, WV-LA25B, WV-LA50B, etc, is mounted on the camera together with the optional Lens Mount Converter (C mount adaptor) WV-AD20.

#### **8. Lens Connector (4pin)**

Use this connector to connect the lens with automatic iris control.

#### **9. Flange-back Adjusting Ring**

Use this ring to adjust the backfocus (or picture focus) by rotating this ring.

#### **10. Video Output Connector**

This connector receives DC power and vertical drive pulses for the camera from the video monitor and also sends video information to the video monitor. Use a coaxial cable with BNC connectors and connect cable between this connector and the Camera Input Connector on the video monitor WV-BM90A.

#### **11. Rear Cover Fixing Screw**

### **■ Mini CCTV Camera WV-80**

#### **1. Lens**

This is a standard accessory lens, 16mm , F1.6 lens, with a standard C mount and focusing ring.

#### **2. Camera Mounting Screw Holes**

These holes are located on the top and bottom covers and are used to mount the camera onto a mounting bracket or tripod, and is threaded (1/4"-20).

#### **3. Video Output Connector (BNC Type Connector)**

This connector receives DC power and vertical drive pulses for the camera from the video monitor and also sends video information to the video monitor. Use a coaxial cable with BNC connectors and connect cable between this connector and the Camera Input Connector on the video monitor WV-BM90A.

#### **4. Case Fixing Screw (on top and bottom)**

# INSTALLATION

## ■ CCTV Camera WV-BL90A (Option)

The mounting bracket can be fixed either on the upper cover or the lower cover of the camera.

### ● Installation on the wall

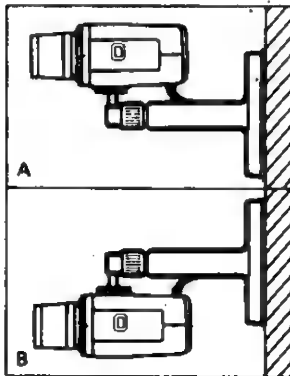


Fig. A, B

### ● Installation on the ceiling

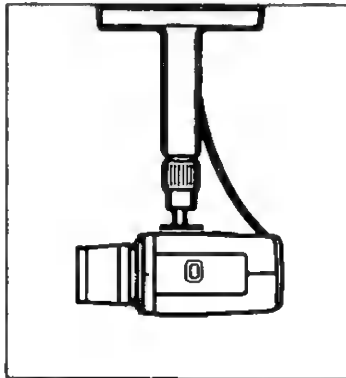


Fig. C

### ● Installation on the shelf or stand

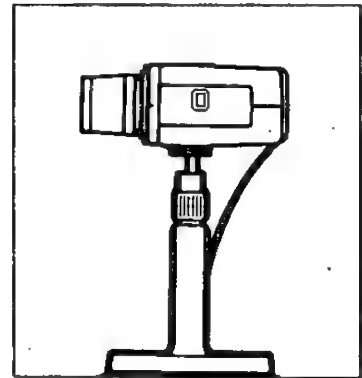


Fig. D

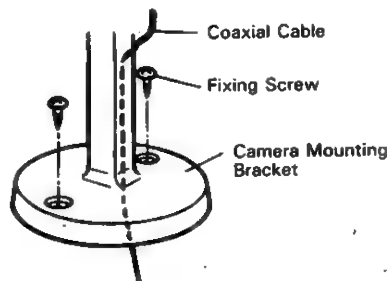
## INSTALLING PROCEDURE

The explanation is for the Fig. A, however the same is applied for the Figs. B, C and D.

1. Install the camera mounting bracket to the wall with 2 screws.

Note:

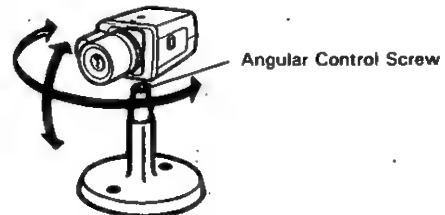
Coaxial cable can be passed through the center hole of the camera mounting bracket.



2. Insert the camera fixing screw of the camera mounting bracket into the camera mounting hole and tighten the screw firmly.

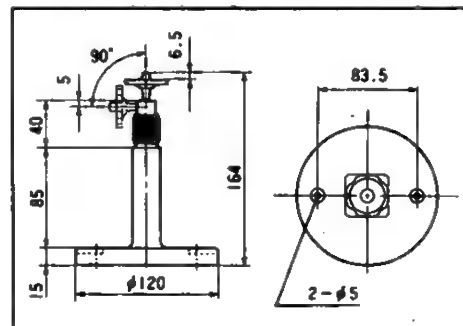


3. Connect the camera and monitor with the coaxial cable and turn on the power switch of the monitor.
4. While viewing the monitor picture, loosen the angular control screw slightly. Adjust the camera's angle to the desired position, and then tighten the screw firmly.



5. While viewing the monitor picture, adjust the Auto Iris Adjustment, on the lens to obtain the proper picture.

## DIMENSION OF MOUNTING BRACKET



### ● Cautions on installation

Use wood screws with the camera mounting bracket that are suitable for installation into a wood base of appropriate dimensions and strength.

For the installation into a material other than wood, refer servicing to qualified service personnel.

## ■ Camera WV-80

The mounting bracket can be fixed either on the upper cover or the bottom cover of the camera.

### ● Installation on the wall

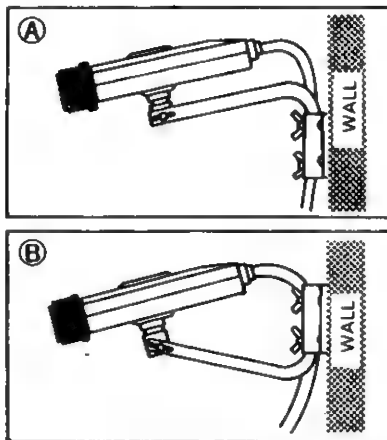


Fig. A, B

### ● Installation on the ceiling

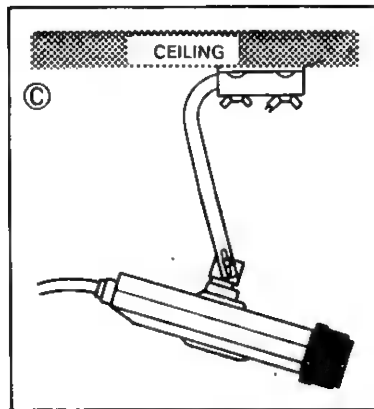


Fig. C

### ● Installation on the shelf or stand

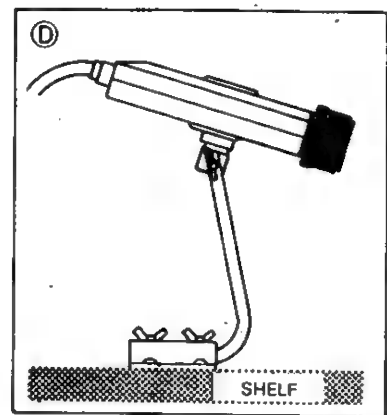
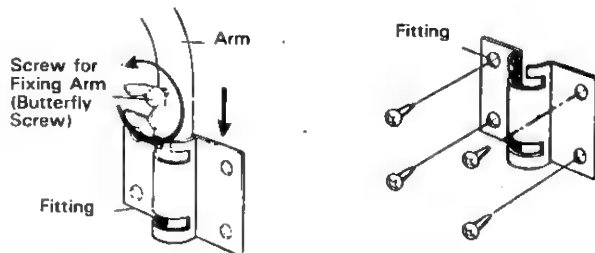


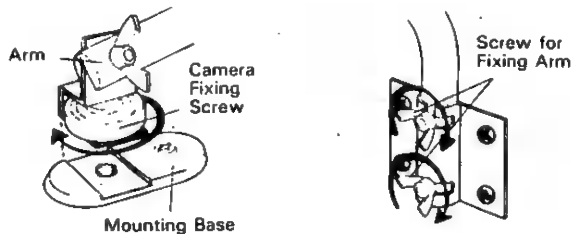
Fig. D

## INSTALLING PROCEDURE OF THE CAMERA MOUNTING BRACKET

1. Loosen the butterfly screw to remove the bracket from the arm and tear off the back sheet of the adhesive tape on the rear of the bracket.
2. Press the bracket to adhere it to the wall and then fix it with 4 screws. At this time, take care to fix it vertically.

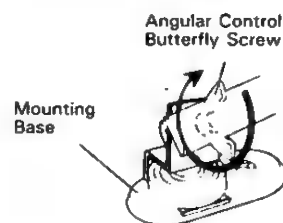


3. Insert the arm into the mounting base of the camera and tighten it firmly with the screw.
4. Insert the arm (fitted with the camera) into the bracket and decide the camera's position with the arm directed to an object then and tentatively fix the camera's position with two butterfly screws.



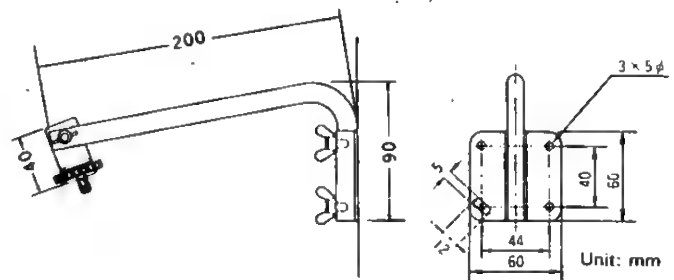
5. Connect the camera and monitor with the camera coaxial cable and turn on the power switch of the monitor.

6. While viewing the monitor picture, loosen the angular control butterfly screw slightly, to fix the upper and lower angles and then tighten the screw firmly.



7. While viewing the monitor picture, turn the focus ring of the lens to adjust for best focus.

## DIMENSION OF MOUNTING BRACKET



### ● Cautions on installation

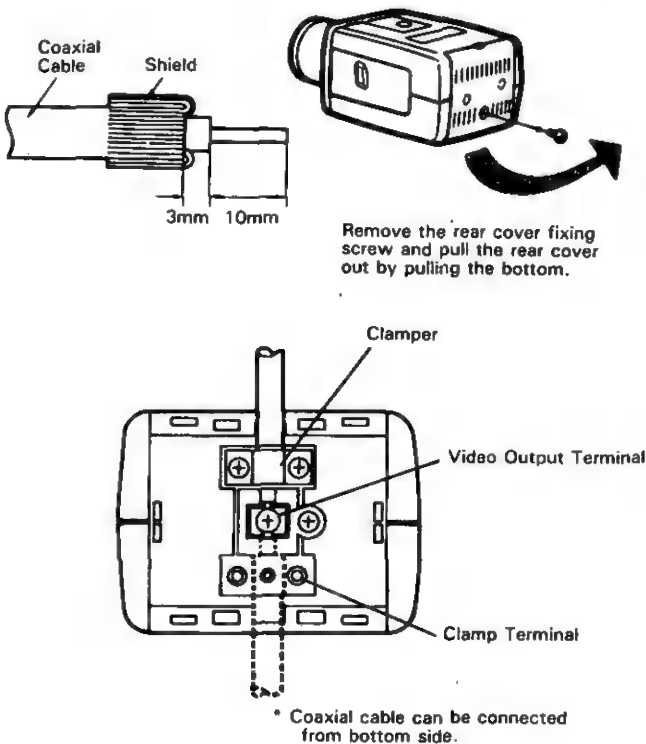
The wood screws provided with the camera mounting bracket are suitable only for installation into a wood base of appropriate dimensions and strength. For the installation into a material other than wood, refer servicing to qualified service personnel.

## CABLE/CONNECTOR INFORMATION

**These connections should be made by qualified service personnel or system installers.**

■ Coaxial Cable for CCTV Camera WV-BL90A

The maximum cable thickness for this camera is RG-6/U type.



**Note:**

**When Assembling the coaxial Cable/BNC connector, follow connector manufacture's specific directions.**

## CONNECTIONS

**CAUTIONS:**

1. **Keep the Power Switch of the monitor, optional Camera Extension Unit and optional Remote Control Unit in the OFF position during connection.**  
If the power of these units are turned on during connection, the camera will not function due to the protection circuit for misconnection.
2. **Connect only the specified cameras WV-BL90A or WV-80.**  
If other type camera is connected, the Mini camera system will not perform due to the protection circuit for wrong camera.

## ■ BASIC SYSTEM

- Connect the coaxial cables between the cameras and monitor (CAMERA INPUT). The approx. maximum cable length is as;

■ CCTV Camera WV-BL90A

Coaxial Cable Type	Maximum Cable Length	DC R/1000 ft. of Inner Conductor
RG-59/U	890 ft. (270 m)	Less than 30 ohms
RG-6/U	2210 ft. (670 m)	Less than 12 ohms

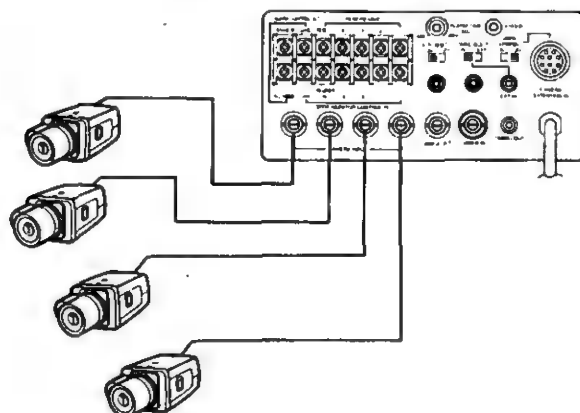
The maximum DC resistance between the camera and monitor is 27 ohms.

### ■ Mini CCTV Camera WV-80

Coaxial Cable Type	Maximum Cable Length	DC R/1000 ft. of Inner Conductor
RG-59/U	760 ft. (230 m)	Less than 30 ohms
RG-6/U	1880 ft. (570 m)	Less than 12 ohms
RG-11/U	3035 ft. (920 m)	Less than 7.5 ohms

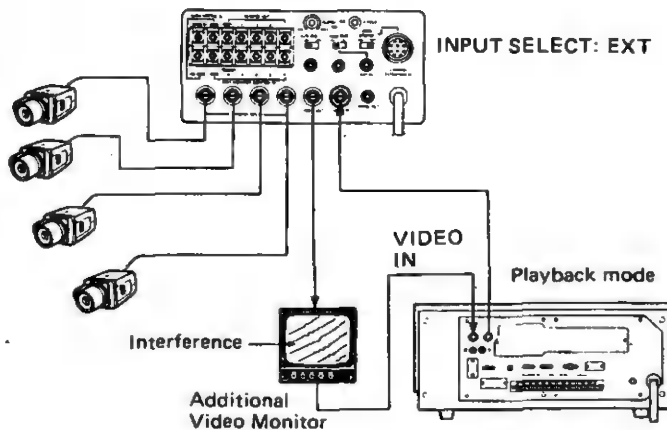
The maximum DC resistance between the camera and monitor is 23 ohms.

- **Connection Diagram**



**Caution:**

Following connection and operation should be avoided since the camera picture on the additional video monitor might have interference of a moving noise as shown in the figure.

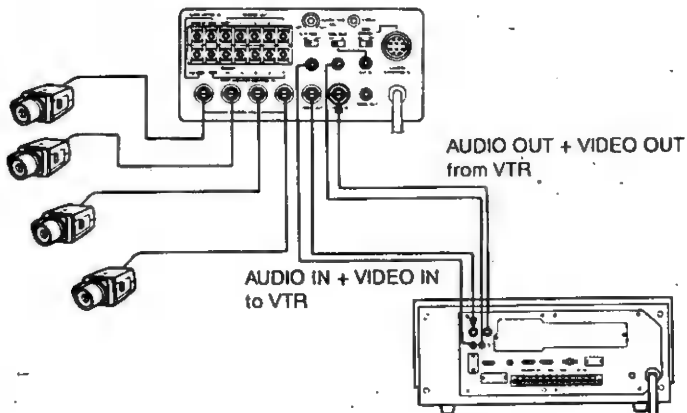


### ■ BASIC SYSTEM WITH VTR

- Connect the single coaxial cables between the cameras and monitor.
- Connect audio and video cables between the Audio Out and Video Out Connectors on the monitor and the Audio In and Video In Connectors on the VTR.
- Connect audio and video cables between the Audio Out and Video Out Connectors on the VTR and the Audio In and Audio Out Connectors on the monitor.

Note:

When monitoring of the VTR Play Back Signals (Audio Video) is desired, set the Input Selection Switch (3) on the monitor to the EXT position.



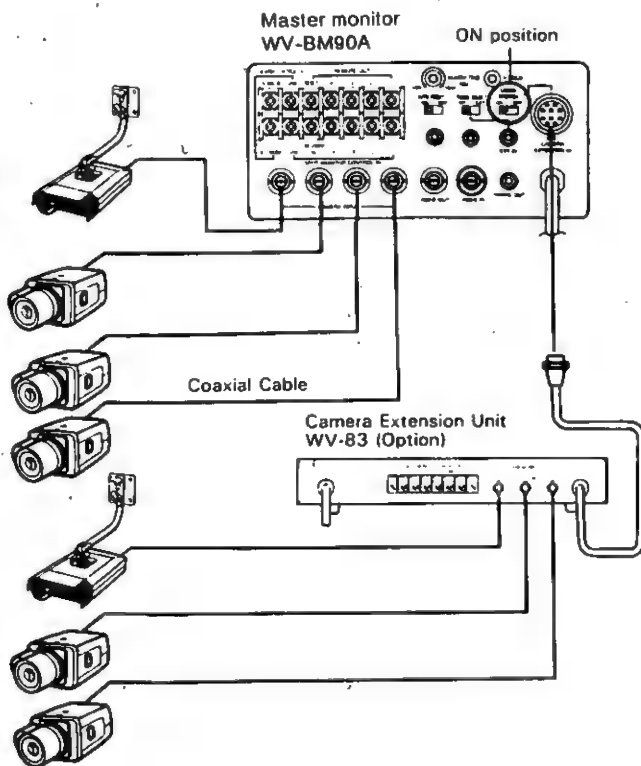
### ■ BASIC SYSTEM WITH OPTIONAL CAMERA EXTENSION UNIT

- Connect the coaxial cables between the cameras and monitor/camera extension unit (CAMERA INPUT).
- Connect the camera extension cable of the camera extension unit to the Camera Extension Input Connector on the monitor.

Note:

Set the Camera Extension Switch on the monitor to ON position.

#### • Connection Diagram



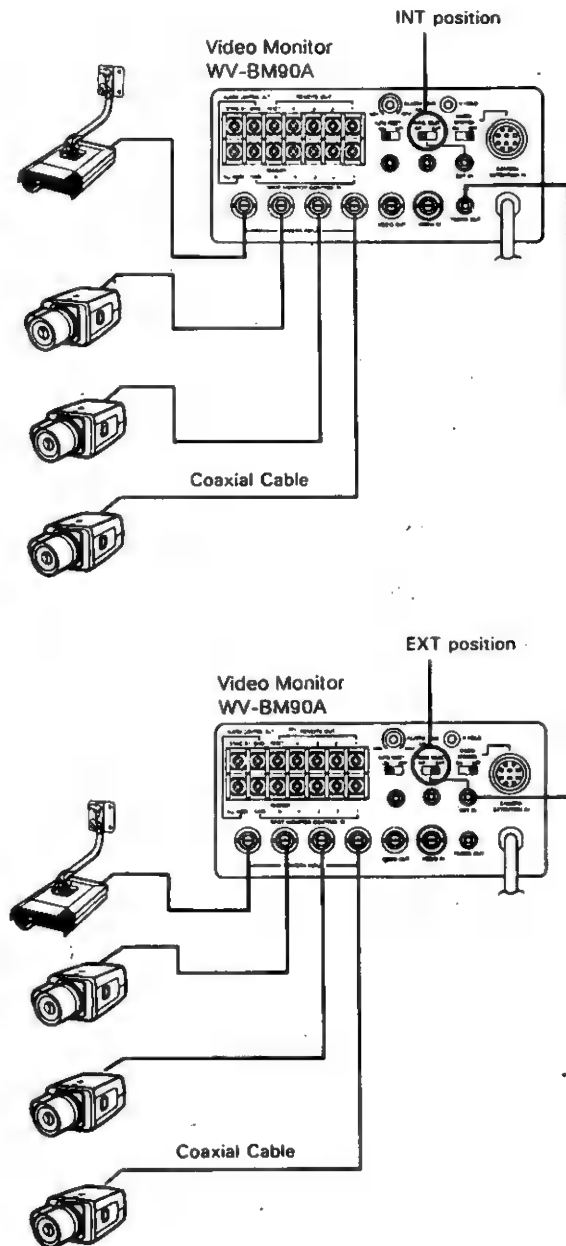
### ■ ADDITIONAL BASIC SYSTEM

- Connect the coaxial cables between the cameras and monitor.
- Connect the Sync Timing Cable between the monitors.

Note:

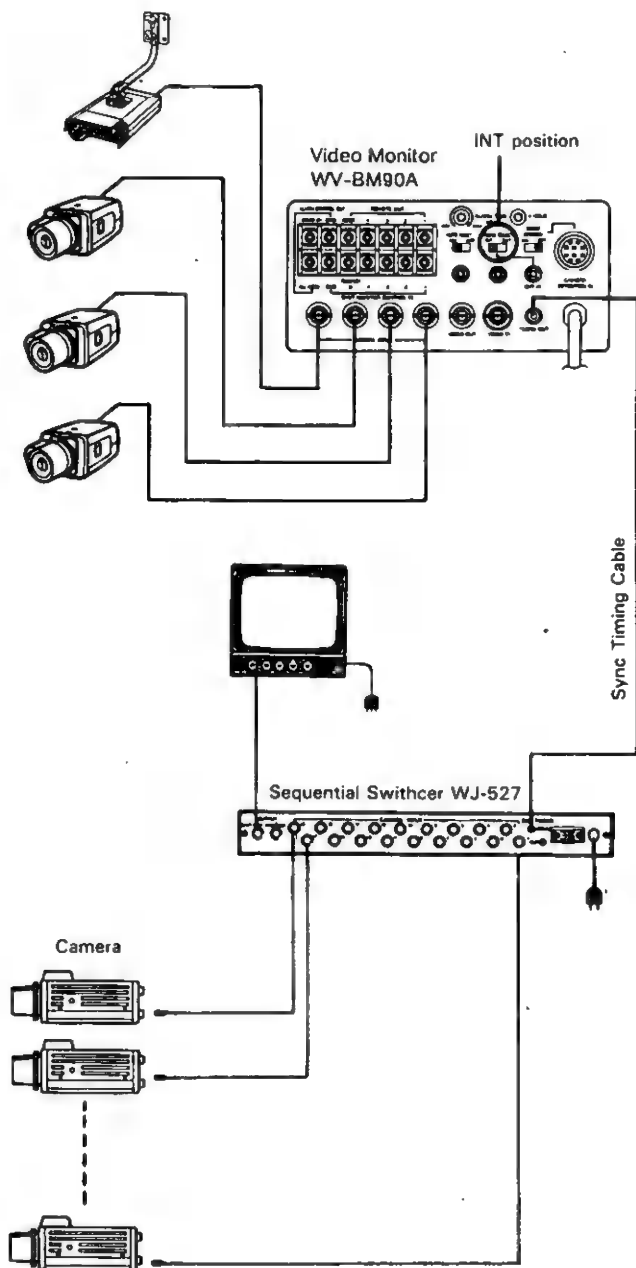
Set the Timing Selection Switch of the master monitor to the INT position and that of the slave monitor to the EXT position.

#### • Connection Diagram



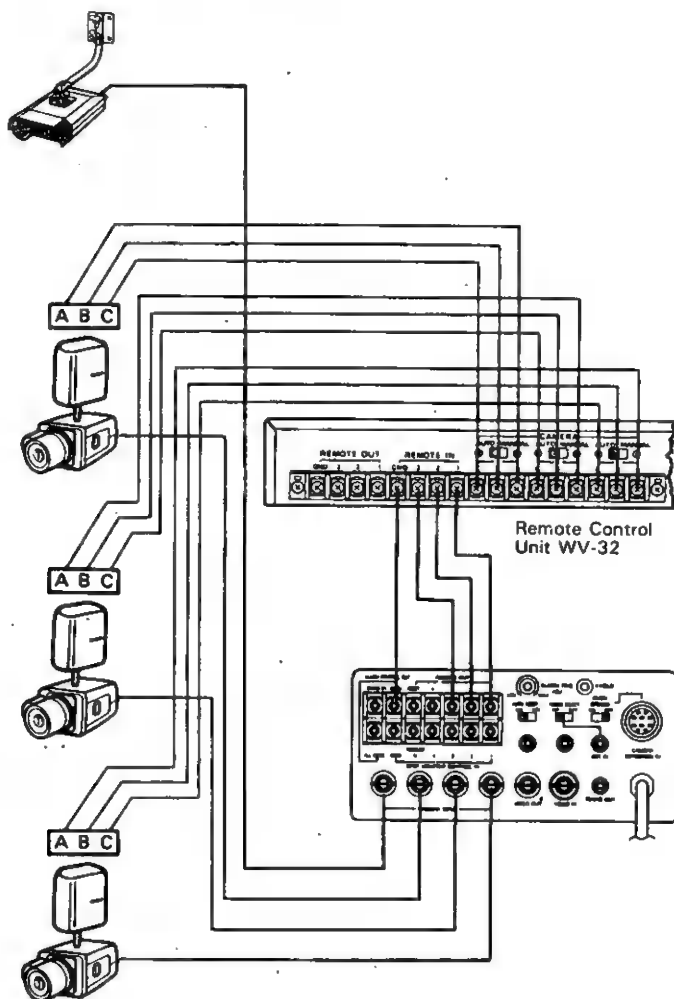
## ■ BASIC SYSTEM WITH OTHER CAMERA SYSTEM

- Connect the coaxial cables between the cameras and monitor.
- Set the Timing Selection Switch of the monitor and sequential switcher of the other camera system.
- Turn the TIME and VTR/EXT Knob of sequential switcher fully counterclockwise until it is clicked and the knob is positioned at VTR/EXT.
- Connection Diagram



## ■ BASIC SYSTEM WITH OPTIONAL AUTO PANNING HEAD WV-35A AND REMOTE CONTROL UNIT WV-32

- Connect the coaxial cables between the cameras and monitor (CAMERA INPUT).
- Connect the wires between the Auto Panning Head and the CAMERA terminal of remote control unit.
- Connect the wires between the REMOTE IN terminals of remote control unit and the REMOTE OUT terminals of the monitor.
- Connection Diagram



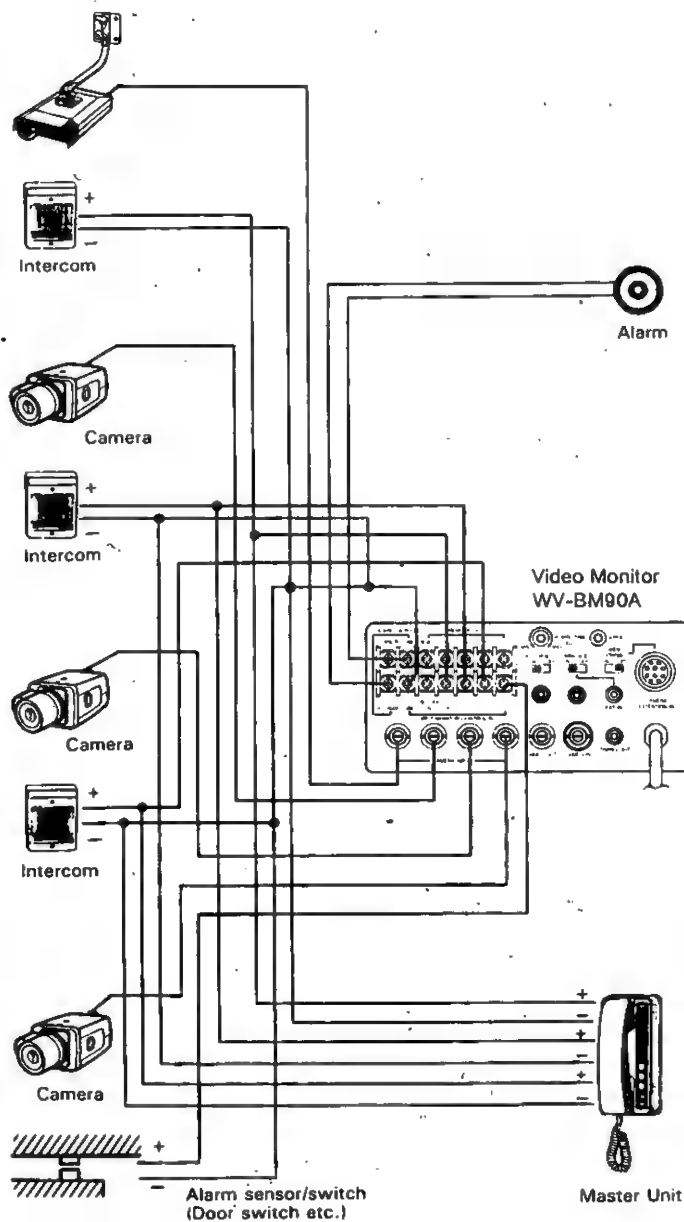
### Note:

1. Confirm the rotational direction of the auto panning head by pressing RIGHT or LEFT button of the remote control unit.  
If/when the rotational direction is reversed, swap the connection for the wires of A and B.

## ■ WITH INTERCOM AND ALARM SENSORS/SWITCHERS

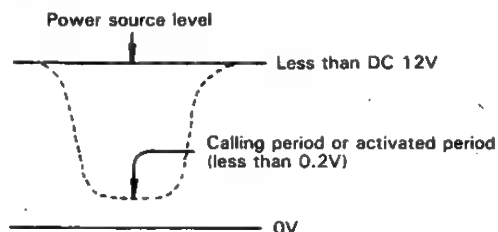
- Connect the coaxial cables between the cameras and monitor (CAMERA INPUT).
- Connect the wires between the intercoms and master unit.
- Connect the two wires between the master unit and the Spot Monitor Control In of the monitor that the intercom should be interrelated with the camera.
- Connect the wires between the alarm sensor/switch (door switch) and the Spot Monitor Control In of the monitor that the alarm sensor/switch should be interrelated with the camera.
- Connect an alarm to the Alarm Control Out of the monitor for desired mode such as STANDBY or ALL MODE.

### • Connection Diagram



## Cautions for intercoms and alarm sensor/switches

- The wiring for intercom system and alarm sensor/switches should be two wires.
- The power source for intercom system and alarm sensor/switches should be less than DC 12V.
- When the intercom or alarm sensor/switches is activated, the line voltage for intercom or alarm sensor/switch should be DC 0 - 0.2V.



There is a limitation for the wiring length among the intercom system, alarm sensor system, optional units and video monitor.

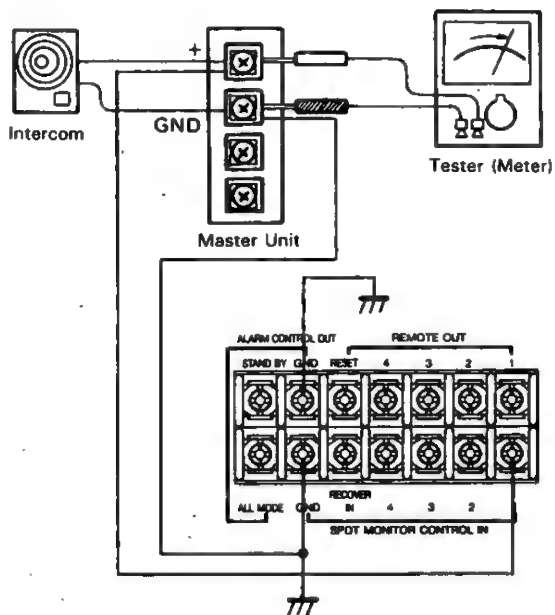
For example, the wiring length for intercom system is as follows;

Wires (mm/Q'ty)	Equivalent AWG	SWG	Maximum Wiring length
0,18/12	22	23	495 ft. (150m)
0,18/20	20	21	825 ft. (250m)
0,18/30	18	19	1320 ft. (400m)
0,18/50	16	17	1980 ft. (600m)

AWG: American Wire Gauge

SWG: British Legal Standard Wire Gauge

- The polarity for the intercom system and the Spot Monitor Control In of the monitor should be matched. Make sure the polarity of the intercom system by tester (meter).

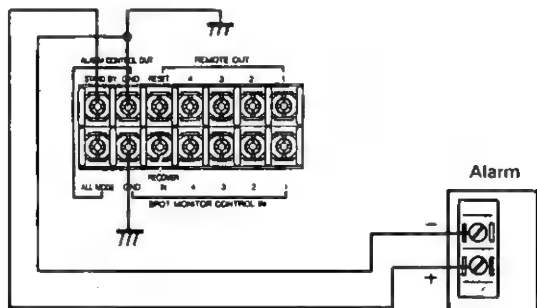




- Do not connect the intercom system of AC power source.

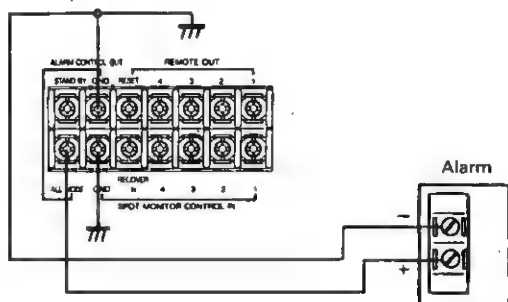
- Two modes for the Alarm Control Out are selected as;  
**STANDBY:**

This terminal is performed at only standby mode of the Mode Selection Switch (2) when the Spot Monitor Control In is activated by intercom or alarm sensor/switch.

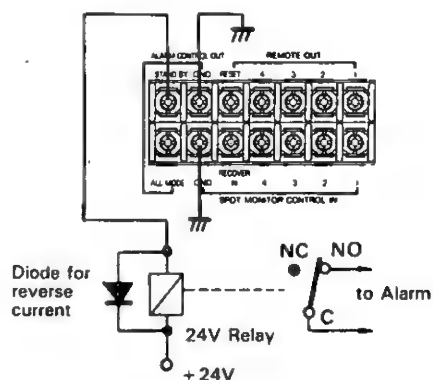


#### ALL MODE:

This terminal is performed at both Standby and ON mode of the Mode Selection Switch (2) when the Spot Monitor Control In is activated by intercom or alarm sensor switch.



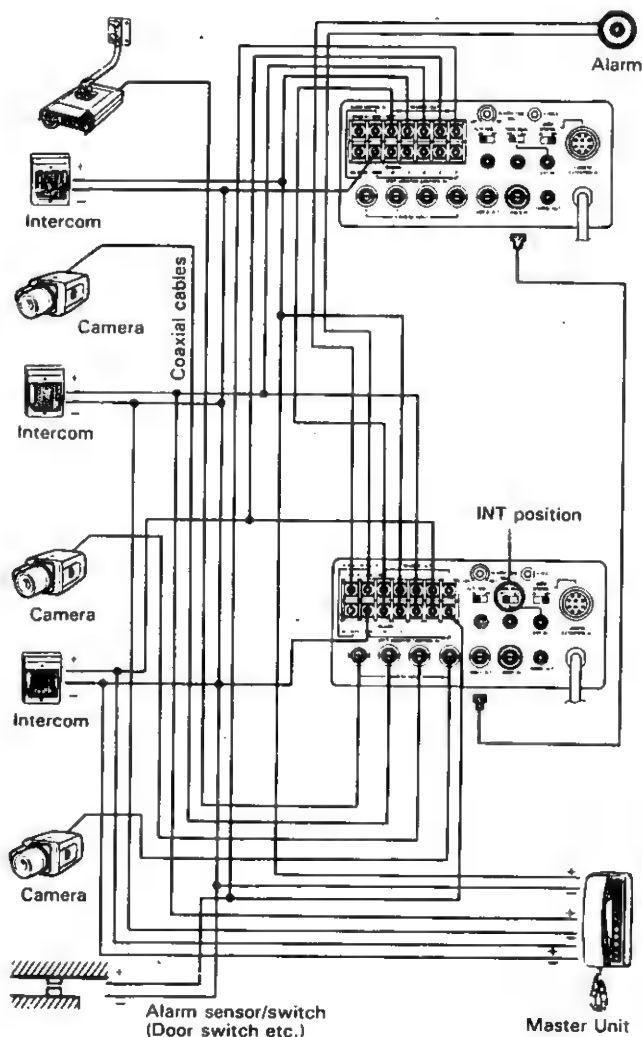
- The polarity for the alarm and Alarm Control Output of the monitor should be matched.
- The power rate of the alarm should be DC 24V, max. 100 mA.
- If the power capacity of the alarm is less than 100mA at DC 24V, the alarm can be connected at the terminal of Alarm Control Out directly.
- If the power capacity of the alarm is more than 100mA at DC 24V, the alarm cannot be connected at terminal directly. In this case, the relay circuit should be used for the alarm.



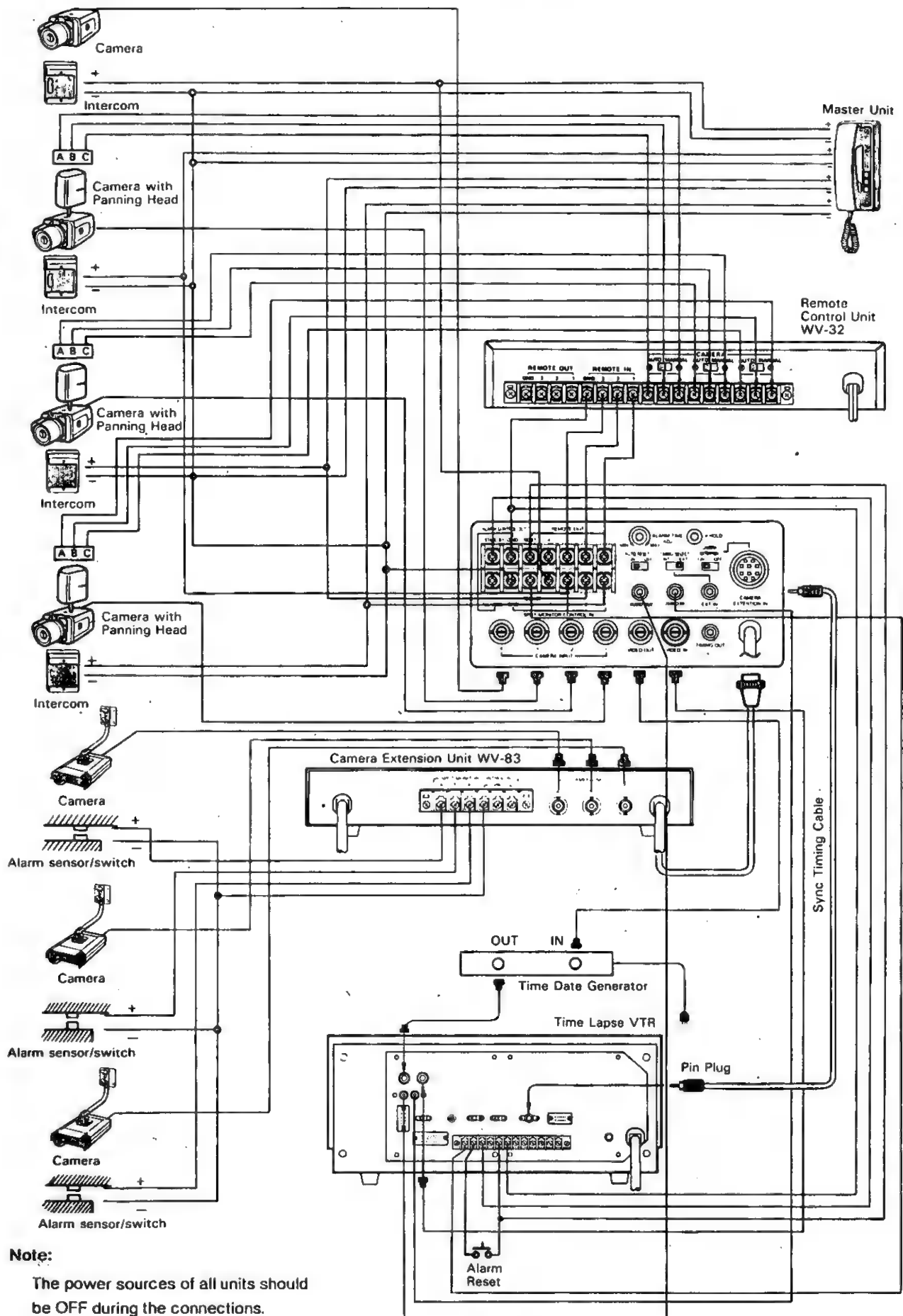
#### WITH ADDITIONAL MONITOR

- Connect a single coaxial cable between the Video Output Connector of the monitor and video input of the additional monitor.
- Connect the wires between the REMOTE OUT terminals of Video Monitor and the Spot Monitor Control In terminals of the Video Monitor.
- Connect the coaxial cables between the cameras and monitor (CAMERA INPUT).
- Connect the two wires between the master unit and the Spot Monitor Control In of the monitor that the intercom should be interrelated with the camera.
- Connect the wires between the alarm sensor/switch (door switch) and the spot Monitor Control In of the monitor that the alarm sensor/switch should be interrelated with the camera.
- Connect an alarm to the Alarm Control Out of the monitor for desired mode such as STANDBY or ALL MODE.

#### Connection Diagram




# CONNECTION FOR GENERAL APPLICATIONS



# OPERATING PROCEDURE

## • SELECTION OF CAMERA

1. Set the Power Switch (POWER) (1) on the front Panel to the ON position by pushing once.  
The switch remains down (  ) keeping the monitor and camera ON, and green lamps for sequence and channel(s) which the camera(s) is/are connected light ON approx. 4 seconds for you to confirm how many cameras are connected.
2. Push the Camera Selection Switch (9) for selecting the desired camera's picture and green lamp will light.

Note:


1. The desired camera's picture can be seen on the monitor by pushing the Camera Selection Switch (9) at the sequence mode.
2. Also, the desired camera's picture can be seen on the monitor by pushing the Camera Selection Switch (9).

Caution:

When the power switch of monitor is turned on and off repeatedly in the short period of time, the camera may not be turned on due to the operation of misconnection protection circuit.

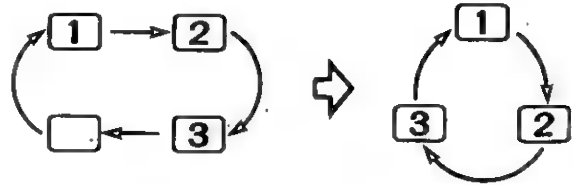
In this case, leave the switch in the OFF position for a few seconds before turning it on again.

## • SEQUENCE MODE (More than two cameras)


1. Set the Power Switch (POWER) (1) on the front Panel to the ON position by pushing once.  
The switch remains down (  ) keeping the monitor and camera ON, and green lamps for sequence and channel(s) which the camera(s) is/are connected light on approx. 4 seconds for you to confirm how many cameras are connected.
2. Set the Mode Selection Switch (MODE) (2) to the ON position.
3. Push the Sequence Switch (SEQUENCE) (8) to be sequential switching and green lamps will light.
4. Adjust the Time Adjustment (TIME ADJ) (7) to be desired sequential switching interval (from 1 to 30 seconds).

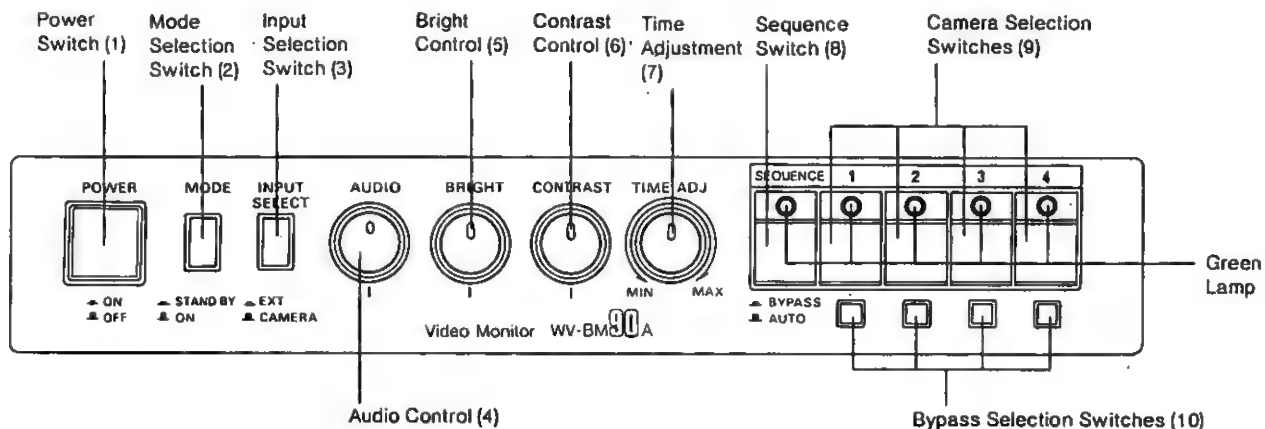
Note:


The sequential switching features the automatic bypass circuit by detecting the presence of the DC power for the camera so that the input connector with no camera connection is automatically skipped.



## • STANDBY MODE-MONITORING PICTURE

1. Set the Power Switch (POWER) (1) on the front Panel to the ON position by pushing once.  
The switch remains down (  ) keeping the monitor and camera ON, and green lamps for sequence and channel(s) which the camera(s) is/are connected light on approx. 4 seconds for you to confirm how many cameras are connected.
2. Set the Mode Selection Switch (MODE) (2) to the ON position.
3. Push the Sequence Switch (SEQUENCE) (8) to be sequential switching.
4. Adjust the Time Adjustment (TIME ADJ) (7) to be desired sequential switching interval (from 1 to 30 seconds).
5. Set the Mode Selection Switch (MODE) (2) to the STANDBY position. The picture on the monitor will disappear, however the sequential switching is actually being carried and the picture can be observed on the additional monitor connected to the Video Output Connector.
6. When the picture of the desired camera is observed/monitored, push the button of Camera Selection Switch for the desired camera and green lamp will light.
7. By pushing the Sequence Switch (SEQUENCE) (8) again, the picture on the monitor will disappear and back to the sequential switching in the STANDBY mode.



- **PRIORITY OF SPOT MONITOR CONTROL IN**
- The selection of the camera by Spot Monitor Control In is set as first come, first served.
- The Camera Selection Switch has a first priority against any selectional signal.
- **VTR PLAYBACK MODE**
- 1. Set the Power Switch (POWER) (1) on the front Panel to the ON position by pushing once.  
The switch remains down (  ) keeping the monitor and camera ON, and green lamps for sequence and channel(s) which the camera(s) is/are connected light on approx. 4 seconds for you to confirm how many cameras are connected.
- 2. Set the Mode Selection Switch (MODE) (2) to the ON position.
- 3. Set the Input Selection Switch (INPUT SELECT EXT/CAMERA) (3) to the EXT position for observing the playback picture.
- **AUTOMATIC RESET SELECTION SWITCH FOR SPOT MONITOR CONTROL INPUT**
- The monitor has the built-in automatic reset circuit which is automatically rest the spot monitor control input signals such as intercom, alarm sensors etc. at approx. 60 seconds after input signal is received.

- The automatic reset circuit is functioned according to the spot monitor control input signals as;

#### 1. Alarm Sensors Signal

The selection of the camera by the alarm sensors signal is automatically reset after approx. 60 seconds and the selection of the camera is returned to the sequential switching.

#### 2. Intercom Signal

##### (a) Intercom Communication

The selection of the camera by the intercom signal is being held during intercom communication and will be reset for the sequential switching after the intercom communication has been over.

##### (b) Intercom Calling

The selection of the camera by intercom calling signal only is automatically reset after approx. 60 seconds and the selection of the camera is returned to the sequential switching.

#### 3. Time Lapse VTR

When the Time Lapse VTR is connected with Mini CCTV System, the selection of the camera by alarm sensors/intercom is automatically reset after reset time set by the Time Lapse VTR and the selection of the camera is returned to the sequential switching.

## OPTIONAL LENS

It is recommended to use the following Auto Iris Control Lens.

Models		WV-LA2.8 (Wide Angle)	WV-LA4.5 (Wide Angle)	WV-LA6B2 (Wide Angle)	WV-LA12B2 (Standard)	WV-LA18 (Telephoto)	WV-LA36 (Telephoto)	WV-LZ81/6A (Motorized Zoom)	WV-LZ81/10 (Motorized Zoom)
Specifications									
Image Size		1/2" (6.4 (H) x 4.8 (V) mm)							
Focal Length		2.8 mm	4.5 mm	6 mm	12 mm	18 mm	36 mm	8.5 – 51 mm (6X)	8 – 80 mm (10X)
Maximum Aperture Ratio		1 : 1.4	1 : 1.4	1 : 1.4	1 : 1.4	1 : 1.4	1 : 1.8	1 : 1.2 (Wide) 1 : 1.3 (Tele)	1 : 1.4 (Wide) 1 : 1.7 (Tele)
Angular Field of View	H	107° 17'	70° 6'	56° 47'	30° 26'	20° 36'	10° 13'	41° 56' (Wide) 7° 14' (Tele)	44° 33' (Wide) 4° 37' (Tele)
	V	86° 4'	55° 41'	43° 31'	22° 49'	15° 22'	7° 39'	31° 19' (Wide) 5° 28' (Tele)	33° 32' (Wide) 3° 30' (Tele)
Focusing Range		Adjusted by camera	0.92 (ft) - ∞ 0.3 (m) - ∞	Adjusted by camera		0.89 (ft) - ∞ 0.27 (m) - ∞	3.3 (ft) - ∞ 1 (m) - ∞	3.3 (ft) - ∞ 1 (m) - ∞	3.6 (ft) - ∞ 1.1 (m) - ∞
Mount		Special C mount (CS mount, 1" - 32UN)							
Optional Filter Size		None	φ37.5 mm P = 0.5	None	None	φ37.5 mm P = 0.5	φ37.5 mm P = 0.5	φ49 mm P = 0.75	φ55 mm P = 0.75
Dimensions		φ1-11/16"x 1-5/16" (φ43x34mm)	φ1-11/16"x 1-5/8" (φ43x41mm)	φ1-11/16"x 1-3/8" (φ43x36mm)	φ1-11/16"x 1-3/8" (φ43x36mm)	φ1-11/16"x 1-5/8" (φ43x41mm)	φ1-11/16"x 1-5/8" (φ43x41mm)	3-3/8"(W)x2-7/16" (H)x3-7/8"(D) 86(W)x62(H)x99(D)	3-3/8"(W)x2-7/16" (H)x3-7/8"(D) 86(W)x62(H)x99(D)
Weights (lbs.)		0.15 (65 g)	0.18 (80 g)	0.11 (50 g)	0.088 (40 g)	0.15 (70 g)	0.18 (80 g)	0.92 (420 g)	0.99 (450 g)

- \* Dimensions and weight indicated are approximate.
- \* Specifications are subject to change without notice.

Specifications \ Models		WV-LA4510 (Super Wide-angle)	WV-LA608 (Wide Angle)	WV-LA1208 (Standard)
Image Size		1/2" (6.4 (H) x 4.8 (V) mm)		
Focal Length		4.5 mm	6 mm	12 mm
Maximum Aperture Ratio		1 : 1.0	1 : 0.75	1 : 0.8
Angular Field of View	H	73°	57°	32°
	V	57°	44°	24°
Focusing Range		Adjusted by Camera		
Mount		Special C mount (CS mount, 1" - 32UN)		
Filter Size		None	φ46 mm, P = 0.75	φ46 mm, P = 0.75
Dimensions		φ1-11/16" x 1-11/16" (φ43 x 43 mm)	φ2-1/16" x 2-1/8" (φ52 x 55 mm)	φ2-9/16" x 2-7/8" (φ66 x 72.5 mm)
Weights (lbs.)		0.2 (85 g)	0.3 (155 g)	0.6 (255 g)

- \* Dimensions and weight indicated are approximate.
- \* Specifications are subject to change without notice.

When a manual iris control lens is to be used with, the following lenses are recommended. In this case, the lighting condition should not be varied.

Specifications \ Models		WV-LM4.5 (Wide-angle)	WV-LM6B2 (Wide Angle)	WV-LM12B2 (Standard)
Image Size		1/2" (6.4 (H) x 4.8 (V) mm)		
Focal Length		4.5 mm	6 mm	12 mm
Maximum Aperture Ratio		1 : 1.4	1 : 1.4	1 : 1.4
Angular Field of View	H	70°6'	56°47'	30°26'
	V	55°41'	43°31'	22°49'
Focusing Range		Adjusted by Camera		
Mount		Special C mount (CS mount, 1" - 32UN)		
Optional Filter size		φ37.5 mm, P = 0.5	None	None
Dimensions		φ1-11/16" x 1-9/16" (φ43 x 41 mm)	φ1-11/16" x 1-1/2" (φ43 x 39 mm)	φ1-11/16" x 1-1/2" (φ43 x 39 mm)
Weights (lbs.)		0.22 (100 g)	0.1 (45 g)	0.077 (35 g)

- \* Dimensions and weight indicated are approximate.
- \* Specifications are subject to change without notice.

# SPECIFICATIONS

## ■ Video Monitor WV-BM90A

Power Supply:	120V AC 60Hz
Power Consumption:	Approx. 70W
Picture Tube:	M10908P4AU (9")
Camera Input:	1Vp-p/75 ohms, composite × 4 (BNC)
Video Input:	1Vp-p/75 ohms, composite × 1 (BNC)
Video Output:	1Vp-p/75 ohms, composite × 1 (BNC)
Audio Input:	—8dB/51 k $\Omega$ × 1 (RCA)
Audio Output:	—10dB/100 $\Omega$ × 1 (RCA)
Speaker Output:	1W
Power Supply for Camera:	Regulated current multiplex method
Camera Switching:	Manual/Auto (Sequence) With auto and manual bypass
Sequential Switching Interval:	Adjustable; 1 to 30 sec.
Resolution (Horizontal):	750 lines at center
Sweep Linearity:	V: Less than 7% H: Less than 5%
External Control Connection Terminal:	SPOT MONITOR CONTROL IN × 4 RECOVER IN × 1 ALARM CONTROL OUT × 2 REMOTE OUT × 4 RESET OUT × 1
Camera Extension Input:	10-pin connector
Alarm Time:	Adjustable; 2 to 30 sec.
Dimensions:	9" (W) × 9-7/16" (H) × 10-5/8" (D) 230 (W) × 240 (H) × 270 (D) mm
Weight:	9.2 lbs (4.2 kg)

## ■ CCTV Camera WV-BL90A

Power Supply:	To be supplied from the specified monitor WV-BM90A or WV-PS10A
Pick-up Device:	574 (H) × 489 (V) pixels, Interline Transfer CCD
Scanning Area:	6.5 (H) × 4.9 (V)mm <sup>2</sup> (Equivalent to scanning area of 1/2" pick-up tube)
Scanning System:	2:1 interlace
Horizontal Scanning Frequency:	15.734kHz
Vertical Scanning Frequency:	59.94Hz
Maximum Distance to the Monitor:	

Coaxial Cable Type	Maximum Cable Length	DC R/1000 ft. of Inner Conductor
RG-59/U	890 ft. (270 m)	Less than 30 ohms
RG-6/U	2210 ft. (670 m)	Less than 12 ohms

Horizontal Resolution:	420 lines at center
Recommended Illumination:	2 footcandles (20 lux)
Minimum Illumination:	0.05 footcandle (0.5 lux) at F1.4, AGC ON
Signal to Noise Ratio:	48 dB (typical)
Ambient Operating Temperature:	—22°F - 122°F (—30°C - +50°C)
Dimensions:	2-7/8"(L) × 2-1/4"(H) × 4-3/8"(P) 74(L) × 58(H) × 112(P) mm
Weight:	0.77lbs (350g)

## ■ Mini CCTV Camera WV-80

Power Supply:	To be supplied from the specified monitor WV-BM90A
Pick-up Tube:	2/3" separate mesh, static focus, deflection Pick-up tube Vidicon (S4097)
Scanning System:	Random interlace (USA standard)
Horizontal Scanning Frequency:	15.75kHz
Vertical Scanning Frequency:	60Hz
Connector:	BNC connector (Female)

**Maximum Distance to the Monitor:**

Coaxial Cable Type	Maximum Cable Length	DC R/1000 ft. of Inner Conductor
RG-59/U	760 ft. (230 m)	Less than 30 ohms
RG-6/U	1880 ft. (570 m)	Less than 12 ohms
RG-11/U	3035 ft. (920 m)	Less than 7.5 ohms

Resolution:	500 lines at center
Minimum Illumination:	10 lux (1 footcandle) at F1.6
Ambient Operating Temperature:	14°F - 122°F (-10°C - +50°C)
S/N Ratio:	More than 40dB
Dimensions (including hood):	4"(W) × 1-15/16"(H) × 8-1/4"(D) 102 (W) × 49 (H) × 210 (D) mm
Weight (including hood & lens):	1.4 lbs (0.64 Kg)

Weights and dimensions shown are approximate.  
Specifications are subject to change without notice.

## OPTIONAL ACCESSORIES

### ■ Optional Accessory for WV-BM90A

- Camera Extension Unit WV-83

### ■ Optional Accessories for WV-BL90A

- Camera Drive Unit WV-PS10A, WV-PS104
- Auto Panning Head WV-35A
- Remote Control Unit WV-32
- Camera Housing WV-40
- Drip Proof Fan/Heater Housing and Power Supply WV-46/KT
- Automatic Iris Control Lens
  - WV-LA2.8
  - WV-LA4.5
  - WV-LA6B2
  - WV-LA12B2
  - WV-LA18
  - WV-LA36
  - WV-LA8B
  - WV-LA16B
  - WV-LA25B
  - WV-LA50B
- Manual Iris Control Lens
  - WV-LM4.5
  - WV-LM6B2
  - WV-LM12B2
- Automatic Iris Zoom Lens
  - WV-LZ81/6A
  - WV-LZ81/10
- Aspherical Hi-speed Lens
  - WV-LA4510
  - WV-LA608
  - WV-LA1208
- Lens Mount Converter (C mount Adaptor) WV-AD20
- Microphone Unit WV-MC1

### ■ Optional Accessories for WV-80

- Heavy-duty Camera Housing WV-95
- Panning Head WV-435
- Remote Control Unit WV-438
- Wide Angle Lens LZ-ML10

# Panasonic

Communications & Systems Company

Division of Matsushita Electric Corporation of America

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